



US006262684B1

(12) **United States Patent**
Stewart et al.

(10) **Patent No.:** **US 6,262,684 B1**
(45) **Date of Patent:** **Jul. 17, 2001**

(54) **STYLUS ANTENNA**

(75) Inventors: **Kurt Stewart**, Lehi; **Sy Prestwich**,
Riverton; **Jeffrey L. Jones**, Orem;
Steven Lo Forte, Midvale, all of UT
(US)

(73) Assignee: **3Com Corporation**, Santa Clara, CA
(US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/604,713**

(22) Filed: **Jun. 27, 2000**

(51) Int. Cl.⁷ **H01Q 1/24**

(52) U.S. Cl. **343/702**; 343/900; 345/179;
178/18.04; 178/19.01

(58) Field of Search 343/702, 850,
343/852, 888, 889, 900, 901; 345/179,
180, 181; 178/18.01, 18.03, 18.04, 19.01,
19.04; H01Q 1/24

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,627,348 5/1997 Berkson et al. .

5,635,682 6/1997 Cherdak et al. .
5,889,512 3/1999 Moller et al. .
5,959,260 * 9/1999 Hoghooghi et al. 178/18.03
5,973,677 * 10/1999 Gibbons 345/179
6,104,350 * 8/2000 Ng et al. 343/702

* cited by examiner

Primary Examiner—Tho G Phan

(74) *Attorney, Agent, or Firm*—Workman, Nydegger &
Seeley

(57) **ABSTRACT**

The present invention discloses antenna structures for portable digital devices that continuously receive radio signals in both the extended and the retracted antenna positions. In addition, the disclosed antenna structures tune the antenna based on the position of the antenna to achieve good impedance matching, which is particularly useful in reducing the noise and interference, while maximizing the available power for radiation from the portable digital devices. More specifically, a multiple position stylus antenna is disclosed that incorporates an antenna into a stylus for use with a Personal Digital Assistant (PDA). The stylus antenna uses one radiating element tuned for optimal performance in the extended position and synthesizes a compensation impedance to match the impedance of the feeding transmission line in the retracted position.

22 Claims, 5 Drawing Sheets

